

Range extensions and other notes on some restricted-range forest birds from West Kilombero in the Udzungwa Mountains, Tanzania

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The Udzungwa Mountains are located in central Tanzania and have an altitudinal range of 300 to 2600 m. They are part of the Eastern Arc Mountains which are defined on phyto-geographical evidence as the ancient crystalline mountains under the direct climatic influence of the Indian Ocean, situated in southeast Kenya and eastern Tanzania from the Taita Hills to the Udzungwa Mountains (Lovett 1990). The Eastern Arc Mountains are well-known for their high level of endemism (for a review see Collar & Stuart 1988). The Udzungwas are also part of the East Coast Escarpment Montane Forest Group stretching from the Usambara Mountains in Tanzania to the Nyika Plateau in Malawi which has been defined on the basis of avifaunal distribution and which largely corresponds to Moreau's Tanganyika-Nyasa Montane Group (Stuart *et al.* in press).

Several avifaunistic studies (reviewed in Jensen & Brøgger-Jensen 1992) have been carried out in the Udzungwa Mountains, which are probably the most important centre of endemism in Eastern Africa for birds and mammals (Rodgers & Homewood 1982, Jensen & Brøgger-Jensen 1992, this study). Some of the Udzungwa Mountain forests are reasonably well surveyed, for example: Mwanihana, Dabaga and Mufindi, and in part Kigogo Forest and the southern part of the Udzungwa Scarp Forest Reserve (Figure 1, Jensen & Brøgger-Jensen 1992). Other areas, including the large isolated forest tracts in West Kilombero Scarp Forest Reserve (as defined in Rodgers & Homewood 1982), have so far been unexplored.

The present paper summarizes observations from 1991–92 of certain little-known bird species (species treated in Collar & Stuart [1985]) from the West Kilombero Scarp Forest Reserve, with notes on geographical range, altitudinal range and ecology. Two new restricted-range bird species were added to the Udzungwa list: A distinctive new perdicine species with closest relatives in the Indo-Malayan region (Dinesen *et al.* in press) and Amani Sunbird *Anthreptes pallidigaster*. This underlines the importance of the Udzungwas as a "hot spot" for many restricted-range species. The known range within the Udzungwas was extended for several restricted-range species, including Rufous-winged Sunbird *Nectarinia rufipennis*. A complete species list for the areas visited will be published in a separate paper.

Study areas

We worked in the Ndundulu and Nyumbanitu Mountains, Iringa District, Iringa Region (Figure 1), within the West Kilombero Scarp Forest Reserve but outside the Udzungwa Mountains National Park (gazetted in February 1992).

The forest covering the Ndundulu Mountains east of Udekwa village forms only the westernmost part of a bigger forest area of 240 km² (36°27'–36°42'E, 7°39'–7°51'S) around the peak of Mount Luhombero (2576 m), the whole complex being surrounded by grassland. The study area has a continuous cover of forest from 1350 to 2400 m and is dominated by numerous ridges and steep slopes along permanent fast flowing

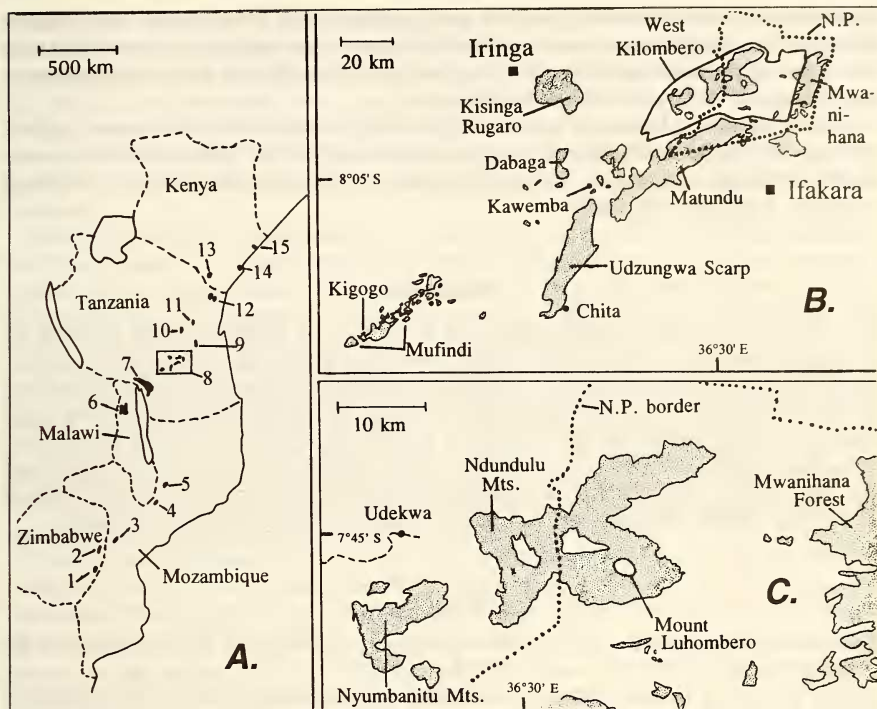


Figure 1. Maps showing localities mentioned in the text. **A.** eastern Africa: 1. Chirinda Forest, 2. Vumba Highlands and Stapleford, 3. Mt Gorongosa, 4. Mt Chiperone, 5. Mt Namuli, 6. Nyika Plateau, 7. Southern Highlands and Mt Rungwe, 8. Udzungwa Mts, 9. Uluguru Mts, 10. Ukaguru Mts, 11. Nguru Mts, 12. Usambara Mts, 13. Taita Hills, 14. Sokoke Forest, 15. Tana River. **B.** The Udzungwa Mts (enlargement of rectangle in **A**): border of West Kilombero Scarp Forest Reserve indicated by solid line, border of the Udzungwa Mts National Park with a dotted line. **C.** The Ndundulu and Nyumbanitu Mts

streams. The vegetation ranges from submontane evergreen forest to upper montane forest (*sensu* Pócs 1976) and is extremely varied, often within a few metres, in composition and structure, depending on, for example, altitude, orientation, soil and exposure. Some low-lying areas at 1350 to 1400 m at the forest edge had 20 to 25-m tall trees and were not as luxuriant as the interior wet forest between 1450 and 1750 m which had 25–35-m tall trees. More remote, and therefore less well surveyed, parts at about 1400–1600 m altitude had wet and very luxuriant forest with 40-m (emergents 50 m) tall trees abundant in epiphytes, and a mixture of places with open understorey and light gaps with dense vegetation. At altitudes above c. 1800 m and at some north- and west-facing slopes, the forest was drier with 20–30-m tall trees and denser undergrowth. A botanical survey was carried out by Hall (1986).

The Nyumbanitu Mountains south of Udekwa have 55 km² covered with forest (36°19'–36°26'E, 7°47'–7°54'S). In the study area the forest ranges from 1300 to 2300 m.

Between 1450 and 1750 m it was wet and luxuriant with 35–40-m tall trees. Below 1450 m it gradually became more dry but had many 30-m tall trees. Above 1850 m it contained much bamboo in the study area, but good high altitude forest was present as well, especially between 2100 and 2300 m.

The Udzungwa Mountains have a single rainy season from November to May peaking in March–April. Annual rainfall is estimated to be 1800–2000 mm on the southeast-facing escarpment, decreasing rapidly westwards to 660 mm yr⁻¹ at Iringa (Rodgers & Homewood 1982).

Methods

The observations were made during field work for our Master's thesis projects on montane forest birds. These studies deal with feeding ecology of greenbuls, mixed-species flocks, understory bird communities and habitat requirements of different bird species. Field data were obtained by mist-netting and detailed observation. We spent four and a half months in the Ndundulus in July–September 1991 and November–January 1991/92 (altogether about 450 man days; 1280 birds of 58 species ringed) and one month in the Nyumbanitus in March–April 1992 (about 50 man days; 221 birds of 25 species ringed). Altitudes were measured using an aneroid Thommen altimeter.

Results

The nomenclature follows the first four volumes of *The Birds of Africa* (Brown *et al.* 1982, Urban *et al.* 1986, Fry *et al.* 1988, Keith *et al.* 1992). For species not yet treated in *BoA* we follow Britton (1980) except where otherwise stated. Where the number of individuals is mentioned we have tried to avoid repetitions. Ringed birds are not included in the number of observed birds.

Perdicini, unnamed genus and species

A new and very distinctive species (Dinesen *et al.* in press) of the tribe Perdicini (Phasianidae) was discovered in the Ndundulu Mountains on 3 July 1991 where a group of 3–4 birds were seen. Its closest relatives are hill-partridges *Arborophila* from Asia. The new species is locally common in the Ndundulu Mountains where it was seen on 78 occasions involving 227 bird sightings between 1350 and 1900 m. In the Nyumbanitus it was seen on seven occasions involving 19 bird sightings between 1500 and 1700 m and is probably locally common there as well. It is a bird of the forest interior and was mainly seen in small flocks of up to eight birds walking slowly on the forest floor. The species is quite easy to detect and it seems most likely that it is absent from other rather well surveyed areas of the Udzungwa Mountains such as Mwanihana Forest, Dabaga Forest and the southern part of the Udzungwa Scarp Forest Reserve. It should be noted that the known range of this new perdicine species, although not immediately threatened, is nevertheless extremely small.

Dappled Mountain Robin *Arcanator orostruthus*

The systematic position of this rare species has been the subject of much controversy (see Irwin & Clay 1986, Jensen & Brøgger-Jensen 1992). It is known from only three isolated localities. The nominate subspecies was described in 1933 from Mt Namuli in

Moçambique (Vincent 1933), but there are no subsequent records from that locality. *A. o. amani* was described from the East Usambara Mountains (Moreau 1935), where population estimates range from a few hundred to a few thousand individuals (Keith *et al.* 1992). The Udzungwa race *A. o. sanjei* was discovered in 1981 in Mwanihana Forest, where it is uncommon (Jensen & Stuart 1982), and has subsequently been recorded between 1450 and 1700 m in the southern part of the Udzungwa Scarp Forest Reserve, where it seems to be fairly common (Jensen & Brøgger-Jensen 1992, Moyer in press).

In the Ndundulus 17 individuals were observed between 1450 and 1700 m, and one bird was ringed. The species appeared to be generally uncommon in the best surveyed areas but was more common in the more remote wet and luxuriant forest. In the Nyumbanitus 15 individuals were observed and two birds ringed between 1550 and 1750 m, where it was fairly common in wet, luxuriant forest.

All observations are from wet forest. The species was elusive and often difficult to see. It was strongly ground-dwelling, occurring in areas with scattered, tall herbs and also on places with open forest floor patches surrounded by more or less dense patches of shrubs, herbs and *Cyperus*. Recordings were made of three different types of song (all consisting of short, melodious, clear stanzas, sometimes resembling those of orioles), of the alarm call which was an unmistakable babble sounding like small bells, and of a three-noted whistling call (Svendsen & Hansen 1992).

The Dappled Mountain Robin lived sympatrically with the Spot-throat *Modulatrix stictigula* and the Pale-breasted Illadopsis *Trichastoma rufipennis* in both areas. The Spot-throat was, however, not restricted to middle altitude wet forest but was also common in the drier high altitudes of the Ndundulus.

Swynnerton's Robin *Swynnertonia swynnertoni*

The Udzungwa subspecies *S. s. rodgersi* is isolated by 1100 km from *S. s. swynnertoni* and *S. s. umbratica*, known from a few localities in Zimbabwe (Chirinda Forest, Vumba Highlands and Stapleford) and Moçambique (Mt Gorongoza) (Collar & Stuart 1985). It was discovered in 1981 in Mwanihana Forest, where it is uncommon (Jensen & Stuart 1982), and has subsequently been recorded in the southern part of the Udzungwa Scarp Forest Reserve between 1450 and 1700 m, where it is more common (Jensen & Brøgger-Jensen 1992, Moyer in press) and, surprisingly, in the foothills of the East Usambara Mountains below 400 m (Watson & Perkin 1992).

In the Ndundulus it was observed between 1350 and 1700 m on about 75 occasions (eight birds ringed), most frequently in the lower part of the altitudinal range where it must be locally common. Seen most often on the ground or on fallen logs, sometimes just above the ground on small branches. Observed in more or less wet forest, mainly in places with an open forest floor, an abundance of dead leaves and scattered patches of shrubs, herbs and *Cyperus*, but sometimes in more dense understorey vegetation. The species was very elusive and was heard more often than seen. Song and warning call were recorded, the song being a slow series of three (rarely four) melancholic, high pitched notes and the call a thin trill (Svendsen & Hansen 1992).

Sharpe's Akalat *Sheppardia sharpei* occurred sympatrically with Swynnerton's Robin and clearly outnumbered it. Iringa Akalat *Sheppardia lowei* was seen on only few occasions below 1650 m.

Swynnerton's Robin was not recorded in the Nyumbanitu Mountains although what we consider as suitable habitats were visited.

Iringa Akalat *Sheppardia lowei*

Known from a restricted number of montane forests in the Southern Highlands of Tanzania and the Udzungwas, most of them relatively dry. Also recently discovered in dry forest in the Ukaguru Mountains (Evans & Anderson 1992). In the Udzungwas it has been recorded from the southern part of the Udzungwa Scarp Forest Reserve, where it occurs in wet forest between 1400 and 1700 m (Jensen & Brøgger-Jensen 1992, Moyer in press), from Kigogo, Mufindi and Dabaga (Collar & Stuart 1985, Jensen & Brøgger-Jensen 1992) and from Kisinga Rugaro Forest Reserve (authors' observations 1992).

In the Ndundulu Mountains about 50 individuals were observed between 1450 and 2400 m and 16 birds were ringed. The Iringa Akalat was fairly common above 1800 m where the forest gradually changes to become more dry with a denser understorey. It was mainly seen on or near the ground, but when giving warning calls, sometimes up to 3 m above the ground. The Iringa Akalat was altitudinally segregated from the common Sharpe's Akalat, which occurred only up to 1850 m. The Olive-flanked Robin Chat *Cossypha anomala* occurred in much the same altitude and habitat as the Iringa Akalat but also in even drier forest parts. (See also notes under Swynnerton's Robin.)

In the Nyumbanitus, the Iringa Akalat was fairly common with 30 individuals recorded between 1500 and 1850 m and 33 birds ringed (including juveniles which were quite abundant in the study period). It occurred here in wet, luxuriant forest, unlike in the Ndundulus, and coexisted with Sharpe's Akalat. The latter definitely outnumbered it in the lower part, but the proportion of Iringa Akalat clearly rose with an increase in altitude. The Iringa Akalat probably occurs also above 1850 m here but that part of the forest was only briefly surveyed.

The alarm call (a rattle with sharp whistles incorporated) was recorded (Svendsen & Hansen 1992) but the song was seldom heard.

White-winged Apalis *Apalis chariessa*

Known from the Tana River in Kenya (possibly extinct), the Uluguru and Udzungwa Mountains in Tanzania and a small forest at Mount Chipero in Moçambique (Collar & Stuart 1985). Several small forest localities in southeast Malawi have this species, but the total Malawi population accounts for only about 100 pairs (Dowsett-Lemaire 1989). In the Udzungwas it was previously known from Mwanihana, from the southern part of the Udzungwa Scarp Forest Reserve (Jensen & Brøgger-Jensen 1992, Moyer in press) and from Kawemba Forest Reserve (Lovett & Moyer in press).

In the Ndundulus it occurred at low densities but was not uncommon. Seen almost exclusively between 1350 and 1600 m but occasionally up to 2000 m, which is an altitudinal record for this species. In the Nyumbanitus it was seen on a few occasions at 1350 and 1550 m. Single birds or up to two pairs were joining in rich mixed-species flocks typically containing Square-tailed Drongo *Dicrurus ludwigii*, Dark-backed Weaver *Ploceus bicolor*, Grey Cuckoo Shrike *Coracina caesia*, Yellow-streaked Greenbul *Phyllastrephus flavostriatus*, Apalis warblers and sunbirds. White-winged Apalis foraged almost exclusively in the canopy up to 35 m above the ground but on a few occasions it was seen down to 3–4 m in light gaps. Met most frequently in tall, wet and luxuriant forest.

Uluguru Violet-backed Sunbird *Anthreptes neglectus*

Known from several records on the Kenya coast and from several coastal forests in

Tanzania and northern Moçambique (Collar & Stuart 1985). Fairly common in the East Usambaras (Britton 1980, Watson & Perkin 1992), less so in the Nguru and Uluguru Mountains (Britton 1980). In the Udzungwa Mountains it was previously known from Mwanihana and from the southern part of the Udzungwa Scarp Forest Reserve (Jensen & Brøgger-Jensen 1992, Moyer in press).

In the Ndundulus it was an uncommon member of mixed-species flocks between 1350 and 1400 m. A male was seen with two newly fledged young in December. From the Nyumbanitus there is a single observation of a male in a mixed-species flock at 1350 m.

Amani Sunbird *Anthreptes pallidigaster*

Formerly known only from the East Usambara Mountains 375 km north of the Udzungwas and from Sokoke Forest, Kenya, 250 km further north. In the East Usambara Mountains it occurs from the foothills up to 900 m, being generally uncommon (Collar & Stuart 1985, Watson & Perkin 1992). Sokoke Forest holds a population of 2900–4700 pairs virtually confined to *Brachystegia* woodland (estimated in the 1970s, Britton & Zimmerman 1979).

In the Ndundulus we found it locally in August (dry season, flowering shrubs and trees present), where two pairs and four single males were observed between 1500 and 1550 m. These are the first records of the species above 900 m. No races were recognized by Mackworth-Praed & Grant (1960) or Britton (1980). However, the Ndundulu males differed from the description in Mackworth-Praed & Grant by being bright metallic blue rather than bottle-green. An examination of the type specimen in Tring supports this observation. Thus the Ndundulu population possibly represents an unnamed subspecies.

The species was seen in the canopy about 35 m above the ground, joining in mixed-species flocks of Square-tailed Drongo, Stripe-cheeked Greenbul, Olive Woodpecker *Dendropicops griseocephalus*, Dark-backed Weaver, White-winged Apalis, Brown-headed Apalis *A. alticola* and Olive Sunbird *Nectarinia olivacea*. On these occasions it was seen feeding on arthropods on leaves. It was also seen 7 m above the ground, feeding on nectar together with Collared *Anthreptes collaris*, Banded Green *A. rubritorques*, Olive, Eastern Double-collared *N. mediocris* and Rufous-winged sunbirds *N. rufipennis*.

The nearby low-altitude Matundu Forest is likely to be an additional site for the Amani Sunbird.

Banded Green Sunbird *Anthreptes rubritorques*

Known from the Usambara, Nguru, Uluguru and Udzungwa Mountains, being common only in the East Usambaras (Collar & Stuart 1985) where it recently has been recorded as low as at 250 m in the foothill forests (Watson & Perkin 1992). From the Udzungwa Mountains there were previously only two observations from Mwanihana Forest: a small flock at 1000 m and a male at 850 m (Stuart *et al.* 1987).

In the West Kilombero forests it is also scarce. The only records are of a pair seen on 5 August at 1500 m and of a male seen at 1550 m later the same day, both in the Ndundulus. This is in the upper end of the known altitudinal range of this species. On both occasions the birds were seen 30–35 m above the ground in the highest canopies. The male in the pair foraged on arthropods in *Usnea* lichens and later the pair fed on nectar together with Amani and Collared sunbirds.

Rufous-winged Sunbird *Nectarinia rufipennis*

This distinctive species, discovered in 1981 in Mwanihana Forest (Jensen 1983) and formerly known only from this forest, was considered absent from the dry plateau of the Udzungwa Mountains (Collar & Stuart 1985).

Twelve birds were seen in the Ndundulus between 1350 and 1600 m. All observations were from the interior of wet forest and nearly all from light gaps with dense undergrowth and flowering plants. The observations are of single birds or pairs, seen mainly 2–7 m above the ground but as low as 0.5 m above the ground in December, probably near a nest. The species was also seen ascending from 3 to 30 m when briefly joining a mixed-species flock. Foraging observations include gleaning leaves for arthropods. It has so far only been recorded as a nectarivorous species (Collar & Stuart 1985). Nectar-feeding birds were seen several times at the red flowering shrub *Achyrosperrum carvalhi*, on some occasions together with Collared, Amani, Banded Green, Olive and Eastern Double-collared sunbirds. Breeding was proved in January when a female was seen feeding a juvenile bird.

The Olive Sunbird was common in the altitudinal range of the Rufous-winged Sunbird, whereas the latter was altitudinally segregated below the common Eastern Double-collared Sunbird, which was numerous only above 1600 m and not confined to the wet forest type.

Tanzanian Mountain Weaver *Ploceus nicolli*

We follow Collar & Stuart (1985) with respect to the English name and its species rank. The nominate form is known from the Usambara Mountains where it occurs at low densities (Collar & Stuart 1985). *P. n. anderseni* was described in 1983 (Franzmann 1983) and is known only from the Uluguru and Udzungwa Mountains. Recorded in Mwanihana between 1100 and 1700 m and at Chita at 1500 m (Jensen & Brøgger-Jensen 1992).

In the Ndundulus a few family flocks and single birds were observed at 1850 and 2150 m. The birds were foraging on invertebrates by hanging upside-down, searching epiphytes on the underside of branches. Also seen tearing off small pieces of bark. On none of the occasions did the birds join in mixed-species flocks. Seen at forest edges and crossing open glades of swamp and grassland.

Dark-backed Weavers occurred up to 2000 m but were rather uncommon between 1850 and 2000 m.

Thick-billed Seed-eater *Serinus (burtoni) melanochrous*

This incipient species is endemic to the forests of the Southern Highlands of Tanzania, Mount Rungwe and the Udzungwa Mountains (Collar & Stuart 1985). In the Udzungwa Mountains it has been recorded from Chita, Kigogo and Dabaga (Jensen & Brøgger-Jensen 1992) and from Kisinga Rugaro Forest Reserve (authors' observations, 1992).

It was recorded locally in the Ndundulus between 1700 and 2250 m (three birds ringed), mainly in dry forest above 1850 m. It was not uncommon but very quiet and easy to overlook. Observed from mid-stratum down to ground level, where it was seen foraging on seeds in grasses.

Table 1. Distribution of certain restricted-range (treated in Collar & Stuart 1985) Eastern Arc forest birds. 1 = Moçambique, 2 = Malawi, 3 = Southern Highlands, 4 = Udzungwa Mts, 5 = Uluguru Mts, 6 = Ukaguru Mts, 7 = Nguru Mts, 8 = Usambara Mts, 9 = Taita Hills, 10 = Kenyan coastal forests and 11 = Tanzanian coastal forests (4 – 9 are Eastern Arc Mountains)

	1	2	3	4	5	6	7	8	9	10	11	
Southern Banded Snake Eagle												
<i>Circaetus fasciolatus</i>	●			●	●		●	●		●	●	
Perdicini <i>sp. nov.</i>				●								
Unnamed genus and species				●								
Nduk Eagle Owl ¹												
<i>Bubo poensis vosseleri</i>								●				
Swynnerton's Robin												
<i>Swynnertonia swynnertoni</i>	●			●				●				
Iringa Akalat												
<i>Sheppardia lowei</i>			●	●		●						
Usambara Akalat												
<i>Sheppardia montana</i>								●				
Dappled Mountain Robin												
<i>Arcanator orostruthus</i>	●			●				●				
Taita Thrush ¹												
<i>Turdus abyssinicus helleri</i>									●			
White-winged Apalis												
<i>Apalis chariessa</i>		●		●	●					●		
Long-billed Apalis												
<i>Apalis moreaui</i>	●							●				
Taita Apalis ²												
<i>Apalis thoracica fuscigularis</i>									●			
Mrs Moreau's Warbler												
<i>Bathmocercus winifredae</i>			●	●	●							
Uluguru Bush Shrike												
<i>Malaconotus alius</i>					●							
Uluguru Violet-backed Sunbird												
<i>Anthreptes neglectus</i>	●			●	●		●	●		●	●	
Amani Sunbird												
<i>Anthreptes pallidigaster</i>				●				●		●		
Plain-backed Sunbird												
<i>Anthreptes reichenowi</i>								●		●	●	
Banded Green Sunbird												
<i>Anthreptes rubritorques</i>				●	●		●	●				
Loveridge's Sunbird												
<i>Nectarinia loveridgei</i>					●							
Rufous-winged Sunbird												
<i>Nectarinia rufipennis</i>				●								
Tanzanian Mountain Weaver												
<i>Ploceus nicolli</i>				●	●			●				
Thick-billed Seed-eater												
<i>Serinus (burtoni) melanochrous</i>			●	●								
				Eastern Arc Mountains								

continued

Notes to Table 1

¹ Given full species status by some authors. Treated here as very distinctive subspecies: Nduk Eagle Owl of Fraser's Eagle Owl *Bubo poensis* and Taita Thrush of Northern Olive Thrush *Turdus abyssinicus*.

² A particularly distinctive subspecies of Bar-throated Apalis *Apalis thoracica*.

Discussion

The discovery of a new and very distinctive perdicine with Indo-Malayan affinities in the Ndundulu and Nyumbanitu Mountains emphasizes the importance of these mountains. They also support the Rufous-winged Sunbird, another distinctive species, known otherwise only from Mwanihana Forest. Both species are without close relatives and apparently represent old radiations that have been isolated for a long time. West Kilombero is the only known area where the ranges of these two relict forest species overlap. The area also contains other distinctive species such as Swynnerton's Robin, Dappled Mountain-Robin, White-winged Apalis, Amani Sunbird and Banded Green Sunbird, all of which must be considered as representatives of rather old radiations as well. Newer radiations, with well-known close relatives, e.g. Iringa Akalat, Thick-billed Seed-eater, Tanzanian Mountain Weaver and Uluguru Violet-backed Sunbird are also present. These facts suggest that the West Kilombero forests have enjoyed continuously favourable conditions through long periods with violent changes in climate and vegetation zones and therefore must be considered ecologically very stable.

The discovery of the new distinct perdicine and of the Amani Sunbird underlines the importance of the Udzungwa Mountains within the Eastern Arc. The Udzungwa Mountains hold more than 60 per cent of the restricted range Eastern Arc forest birds (Table 1, species treated in Collar & Stuart 1985).

The discovery of the Amani Sunbird in the Udzungwas (this study) and of Swynnerton's Robin in the Usambaras (Watson & Perkin 1992) strengthens the evidence for the strong faunal connections between these two important Eastern Arc areas which also have Dappled Mountain Robin, Banded Green Sunbird, Uluguru Violet-backed Sunbird and Tanzanian Mountain Weaver in common, plus the superspecies formed by the Iringa and Usambara Akalats (*Sheppardia montana*). Both areas have endemics of their own. They are centres of endemism which have had continuous forest habitat and mutual connection with more widespread forest habitat in certain climatic periods.

The Nyumbanitu Mountains were not as thoroughly surveyed as the Ndundulus. However, we expect several of the restricted range species, so far only recorded in the Ndundulus, to occur in the Nyumbanitus as well, because of the similarity of habitats.

Conclusion

The plateau forests of the Udzungwa Mountains were formerly believed to be dry and species-poor compared to the escarpment forests, e.g. Mwanihana Forest (Collar & Stuart 1985, Jensen & Brögger-Jensen 1992). This study in West Kilombero revealed a remarkably rich avifauna and the presence of a distinctive relict forest perdicine bird as well as of Rufous-winged Sunbird and several other restricted-range species. Mrs

Moreau's Warbler *Bathmocercus winifredae* is the only threatened restricted-range species within the Udzungwas (Collar & Stuart 1985, Jensen & Brøgger-Jensen 1992) which we did not find in West Kilombero. More surveys in other parts of the forest might, however, reveal its presence.

Because of the great habitat variation, with both middle altitude wet forest and high altitude drier forest types, the restricted range avifauna is complex with the occurrence of mainly dry forest species such as Iringa Akalat and Thick-billed Seed-eater as well as of such wet forest species as Rufous-winged Sunbird and Dappled Mountain Robin. Species recorded in West Kilombero but not so far in Mwanihana Forest on the eastern escarpment include the new distinctive perdicine species, Amani Sunbird, Iringa Akalat and Thick-billed Seed-eater (all treated in this paper), and also Pale-breasted Illadopsis, African Hill Babbler *Alcippe abyssinica*, Olive-flanked Robin Chat, Red-capped Forest Warbler *Orthotomus metopias* and Oriole Finch *Linurgus olivaceus*.

Thus several facts stress the high conservation value of the Ndundulu and Nyumbanitu Mountains, both of which lie outside the newly gazetted Udzungwa Mountains National Park.

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SHORT COMMUNICATIONS

The second breeding record of the Goliath Heron *Ardea goliath* in Somalia

The Goliath Heron *Ardea goliath* has been described as rather uncommon but widespread in Somalia with only one breeding record, from the extreme northwest (Ash & Miskell 1983).

An example of this species was seen on 19 August 1989 on the Shabeelle river some 3 km downstream from Aw Dheegle village (1°57'N, 44°50'E) perching in a nest together with one half-grown young bird. The solitary, flat, platform-like nest was constructed from dry branches; it was about 1 m in diameter and about 20 m above the water level in a large tree on the edge of the river. The well-feathered young bird was brownish-grey, about half the size of the parent, and apparently still nest-bound. Its age was estimated as five to six weeks.

Brown *et al.* (1982) state that *A. goliath* lays mainly during the rains and give laying dates for Somalia as September to December; they were evidently aware of Somalia breeding records unavailable to Ash & Miskell.

An attempt is made here to relate the present breeding record to precipitation in the area. In general, the north and south movement of the intertropical convergence zone, with its associated intertropical front and wind patterns, is the major event which shapes the climate of Somalia. Precipitation fluctuates from year to year and from area to area along the coastal land between the Shabeelle and the Jubba rivers. There are two rainy seasons—the *Gu* season is the longer one, lasting from April to June, while the *Deyr* season is the shorter and less reliable, from October to mid December.

Rainfall data for the first nine months of 1989 at stations nearest to the heron's nest are given in Table 1.

The data show that rainfall in central and southern Somalia occurs in pseudo-random showers of relatively small dimensions. On a daily basis there is thus a marked spatial variability, and rains may be intense over limited areas, which would explain the variation between the two locations in Table 1. The listed rainfall figures were recorded